

What is claimed:

1. A device for effecting mitral valve annulus geometry of a heart comprising:

5 a first anchor configured to be positioned within and fixed to the coronary sinus of the heart adjacent the mitral valve annulus within the heart;

10 a cable fixed to the first anchor and extending proximally from the first anchor within the heart;

15 a second anchor configured to be positioned in and fixed in the heart proximal to the first anchor and arranged to slidably receive the cable; and

20 a lock that locks the cable on the second anchor, whereby

25 when the first and second anchors are fixed within the heart, the cable is drawn proximally, and the cable is locked on the second anchor, the geometry of the mitral valve is effected.

20 2. The device of claim 1 wherein the second anchor is configured to be positioned and fixed in the coronary sinus.

25 3. The device of claim 1 wherein the second anchor is configured to be positioned and fixed in the right atrium.

4. The device of claim 1 wherein the first anchor is self-expanding to fix the first anchor in the coronary sinus.

30 5. The device of claim 1 wherein the second anchor is self-expanding to fix the second anchor in the heart.

6. The device of claim 1 wherein the cable includes a pressure distributor.

5 7. The device of claim 1 wherein the second anchor includes the lock.

10 8. The device of claim 7 wherein the lock includes a ratchet.

15 9. The device of claim 1 wherein the cable includes a coupling configured to releasably connect to a cable tension assembly.

20 10. A device for effecting mitral valve annulus geometry in a heart, the device comprising:

first anchor means for anchoring within the coronary sinus of the heart adjacent to the mitral valve annulus;

second anchor means for anchoring within the heart proximal to the first anchor means;

cable means fixed to the first anchor means and extending proximally from the first anchor means, the cable means being slidably received by the second anchor means for spanning between the first and second anchor means; and

lock means for locking the second anchor means to the cable means.

25 11. The device of claim 10 wherein the second anchor means is configured to be positioned within and anchored to the coronary sinus.

12. The device of claim 10 wherein the second anchor means is configured to be positioned within and anchored to the right atrium.

5 13. The device of claim 10 wherein the first anchor means is self-expanding for anchoring in the coronary sinus.

10 14. The device of claim 10 wherein the second anchor means is self-expanding for anchoring in the heart.

15 15. The device of claim 10 wherein the cable means includes pressure distributing means for distributing applied pressure.

20 16. The device of claim 10 wherein the lock means is carried by the second anchor means.

25 17. The device of claim 16 wherein the lock means includes a ratchet.

18. The device of claim 10 wherein the cable includes coupling means for coupling to a cable tension assembly.

25 19. A method of effecting mitral valve annulus geometry in a heart, the method including the steps of:

fixing a first anchor within the coronary sinus of the heart adjacent to the mitral valve annulus;

anchoring a second anchor within the heart proximal to the first anchor;

30 fixing a cable to the first anchor;

extending the cable proximally from the first anchor and slidably through the second anchor;

displacing the cable proximally relative to the second anchor to create tension in the cable; and
locking the second anchor to the cable.

20. The method of claim 19 wherein the anchoring step includes anchoring the second anchor in the coronary sinus.

10 21. The method of claim 19 wherein the anchoring step includes anchoring the second anchor within the right atrium.

15 22. The method of claim 19 wherein the displacing step includes releasably coupling the cable to a cable tension assembly.

23. A system for effecting mitral valve annulus geometry comprising:

a mitral valve annulus device comprising a first anchor configured to be positioned within and fixed to the coronary sinus of the heart adjacent to mitral valve annulus within the heart, a cable fixed to the first anchor and extending proximally from the first anchor within the heart, a second anchor configured to be positioned and fixed in the heart proximal to the first anchor and arranged to slidably receive the cable, and a lock that locks the cable on the second anchor; and

30 a delivery assembly that deploys the mitral valve annulus device, the delivery assembly including a first push tool that engages the first anchor to position the first anchor within the coronary sinus, a second push tool

that engages the second anchor to position the second anchor in the heart, and a tensioning member connectable to the cable that provides tension to the cable between the first and second anchors.

5

24. The system of claim 23 wherein the delivery assembly further includes a guide catheter that guides the mitral valve annulus device into the coronary sinus.

10

25. The system of claim 24 wherein the first push tool comprises a first push tube.

26. The system of claim 25 wherein the second push tool comprises a second push tube.

15

27. The system of claim 26 wherein the guide catheter, the first push tube and the second push tube are coaxially arranged.

20

28. The system of claim 23 further including a releasable coupling that connects the cable of the device to the tensioning member.

25

29. The system of claim 28 wherein the tensioning member is a tensioning cable.

30. The system of claim 23 wherein the second anchor is configured to be positioned and fixed in the coronary sinus.

30

31. The system of claim 23 wherein the second anchor is configured to be positioned and fixed in the right atrium.

32. The system of claim 23 wherein the first anchor is self-expanding to fix the first anchor in the coronary sinus.
- 5 33. The system of claim 23 wherein the second anchor is self-expanding to fix the second anchor in the heart.
- 10 34. The system of claim 23 wherein the cable includes a pressure distributor.
- 15 35. The system of claim 23 wherein the second anchor includes the lock.
- 20 36. The system of claim 35 wherein the lock includes a ratchet.
- 25 37. A method of effecting mitral valve geometry of a heart, the method including the steps of:
 advancing a guide catheter into the coronary sinus of the heart adjacent to the mitral valve annulus;
 pushing a self-deploying first anchor down and out of the guide catheter to deploy the first anchor in the coronary sinus adjacent to the mitral valve annulus;
 providing the first anchor with a cable extending proximally from the first anchor and through a second self-deploying anchor;
 displacing the second self-deploying anchor down the guide catheter to a position proximal to the first anchor;
 withdrawing the guide catheter while holding the second anchor to deploy the second anchor;

pulling on the cable to create tension in the cable;
and

locking the cable to the second anchor.

5 38. The method of claim 37 wherein the pushing step
includes the step of pushing the first anchor with a push tube
dimensioned to slide within the guide catheter.

9 10 39. The method of claim 37 wherein the displacing step
includes the step of pushing the second anchor along the cable
with a second push tube dimensioned to slide within the guide
catheter.

15 40. The method of claim 37 including the further step of
releasably coupling the cable to a tension cable prior to the
pulling step.

20 41. The method of claim 37 wherein the displacing step
includes the step of deploying the second anchor in the coronary
sinus.

25 42. The method of claim 37 wherein the displacing step
includes the step of deploying the second anchor in the right
atrium of the heart.

43. The method of claim 37 wherein the pushing step
includes locating the first anchor proximally to the circumflex
artery within the coronary sinus.

30